Space Weather Forecast

Issued on Tuesday 26 November 2024 at 13:06 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate to High Solar Activity expected with Moderate-flares likely. G1/G2 Minor/Moderate Geomagnetic Storm expected 28 Nov.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with a number of Moderate-class flares observed in the past 24-hours, peaking with a Moderate-class flare event at 25/1212 UTC from a large spot region in the southeast.

There are currently ten sunspot regions on the visible disc. The two largest spot regions are both in the southeast, approaching centre-disc. Both these regions are magnetically complex, although have seen some intermediate spots fading at times. A region in the southwest has seen its trailing spots consolidating into a larger region of mixed polarity, indicating an increase in magnetic complexity. A region rotating over the NE limb is still a way from becoming completely visible, but was responsible for a near-Strong flare flare on 25 Nov as it rounded the limb.

There was one likely Earth-directed CME (coronal mass ejection) during the period. A filament eruption in the southwest led to an associated CME being ejected from the Sun. Analysis has an Earth impact during the UTC morning of 28 Nov, but this timing may be tweaked with further analysis ongoing.

Solar Wind / Geomagnetic Activity: Solar winds varied between Background and Slightly Elevated levels, due to minor influence from a small coronal hole in the southwest disc, but this slowly declined to Background. The Interplanetary Magnetic Field was Weak throughout. The important north-south component varied weakly with frequent deviations between northward and southward directions observed. Geomagnetic activity was Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: Solar Radiation remained at Background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Moderate to High, with occasional Moderate-class flares likely and a slight chance of isolated Strong flares, primarily from the large regions in the southeast disc, or a returning region currently located close to the northeast limb.

Solar Wind / Geomagnetic Activity: A CME (coronal mass ejection) that left the Sun late on 25 Nov from the southwest disc is likely to affect Earth on Day 3 (28 Nov).

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Solar wind speeds are currently at Background levels and are expected to remain there at first. A rise to Elevated levels is possible following the CME arrival on Day 3.

Geomagnetic activity is expected to be mainly Quiet to Unsettled (Kp0-3) at first. Upon arrival of the CME on Day 3 (28 Nov), G1/G2 Minor/Moderate Geomagnetic Storms are expected, with a slight chance of G3/Major Geomagnetic Storm intervals. Enhanced conditions are likely to persist into Day 4 (29 Nov).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at Background levels, with a slight but increasing chance of Solar Radiation storms occurring later in the period, mainly from the large sunspot regions in the southeast.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	10	80	60
Strong	G3	No	1	1	20	10
Severe	G4	No	1	1	5	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	70	70	70	70
Very Active	R3-R5 (X Class)	No	15	15	15	15

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	15	15	15	20
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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